

UNIVERSITY OF CALIFORNIA.

AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 51.

The Wines of 1885.

As the time for the first racking of the vintage of 1885 is at hand, it is of some interest to discuss the results obtained in the fermentations made at the Viticultural Laboratory, and in the examination of wines sent in for analysis, in order that the merits and defects of this vintage may be compared with those of previous seasons, and the after-treatment and blending governed accordingly.

Of 40 lots of grapes sent in, 34 were sufficiently large for wine-making. Of these 34 fermentations, not one offered any difficulty, the temperature of the cellar being kept somewhat higher than last season, viz., at or near 75 degrees. This temperature would, of course, have been undesirably high for larger masses of wine, but for the samples not exceeding ten gallons proved just right, the highest temperature reached by any one during the violent fermentation being 86 degrees. All fermented out completely during the usual time (of about a week for red wines), cleared rapidly after drawing off, and are sound in every respect. The only exception in regard to regularity of fermentation arose from an accident to the gas jet regulating the temperature in a space set apart for the fermentation of small samples, in which the temperature one morning was found to have risen to 110°. This had completely stopped the fermentation, and apparently killed the yeast, for fermentation was not resumed in the course of three days, although the sugar was only half fermented out. But upon addition of about 30 per cent of fresh must just started in fermentation, the whole went through rapidly and made a perfectly sound, dry wine. There is, of course, nothing new in this, but it is mentioned as undoubtedly typical of a great number of cases of reported "difficult fermentation" during the past vintage, exemplified in a number of samples of wine received for analysis.

Of 39 such samples, thus far received, the extraordinarily large proportion of 17, or nearly 44 per cent, contain unfermented sugar in proportions varying from a trifle (say $\frac{1}{4}$ per cent) to a little more than six, but mostly from three to five. In one case of as much as ten per cent remained in a wine which, besides, was thoroughly acetified and "milk-sour." This wine, it was ascertained, started finely during very hot weather; was allowed to form a "cap" without stirring-in (*foulage*), and suddenly stopped while sweet, evidently from a too great rise of temperature. Then, while being left with the

hope that the fermentation would revive of its own accord, it went wholly wrong and was fit only for the still.

In this case, as in many last season, the total amount of sugar originally in the must was considerably greater than that which could ferment out in any case; viz., over 35 per cent. But the alcohol had only been formed to the extent of 11 per cent, while under proper treatment over 15 might have been reached before fermentation stopped, as was actually done in several cases now before us.

Tannin and Acid.

Apart, however, from the unfermented sugar and from cases of gross mismanagement like the above, both the wines made at the Viticultural Laboratory and the bulk of those sent in, exhibit peculiarities which seem to belong to the vintage as such, independently of grape varieties, and also, to some extent, of the unusual degree of ripeness attained by them. The most prominent of these are larger proportions of both tartaric acid and tannin, appearing in cases where comparison with previous seasons is available.

Thus we find in Gallegos' Zinfandel, from Mission San Jose, in which the tannin usually ranged between 7 and 8.5 (10,000ths), from 11 to 12, and in a sample from the old Palmer (hill) vineyard, at the same place, the extraordinary amount of 24; in the Cabernets from the Santa Clara valley, heretofore showing from 10 to 11, now from 16 to 17.5 tannin. Similar results are now shown from other localities and varieties; and where the determinations have not yet been made the taste indicates a similar increase over previous vintages.

As regards acid, the analyses show that where from 4.5 to 5.0 *pro mille* has been the rule, from six to eight now frequently appear in the must, at least, and so proportionally for lower degrees of acidity. But neither in the musts nor in the wines did this higher acidity appear unpleasantly, doubtless for the reason that the unusually heavy body and high alcoholic strength disguises the acidity and renders it harmonious with the other characters of the product.

It is hardly necessary to insist upon the importance of these points as regards not only the quality of the 1885 wines for direct consumption, but especially their value for blending with previous vintages. It would be extremely desirable to verify the general validity of the above indications by wider comparisons, both as to varieties and localities.

Alcoholic Strength—Arrested Fermentations.

Since in all but the higher locations the saccharine strength of the musts was high in 1885, so ought to be the alcoholic strength of the resulting wines; and this is found to be the case where fermentation has gone through, the extraordinary strength of 16 per cent having been observed in one case, and 15 in quite a number. But, as stated above, in a great many cases some sugar has remained unconverted, and that not only where the sugar exceeded the amount that can be fermented out, but also in many in which the maximum of alcohol would not nearly have been reached; and yet only from 10 to 12 per cent was actually formed. In all of these that have been reliably reported, the great vigor of the first fermentation is noted, and surprise expressed that after such a good beginning it should not have gone through. In fact, the prompt and vigorous starting of the fermentation is very commonly dwelt upon, and has been similarly noted in the fermentations made at the University Laboratory, as well as in the wineries visited during the vintage. It is the usual and predicable outcome of a season like that of 1885, in which all grape varieties matured fully, and should exhibit their best qualities in their wines, if carefully treated.

A vigorous beginning of fermentation necessarily implies an abundance both of yeast-forming material, "germ food," and of yeast germs. If it stops short of the natural limit imposed by the formation of alcohol or exhaustion of sugar, it must be because some influence hostile to the life of the yeast has intervened; and unless more than mere guesswork or conjecture shows the contrary, that influence must be supposed to be excessive rise of temperature as a result of this same vigorous action. The common practice of crushing grapes coming hot from the vineyard, renders this a matter of much more easy and common occurrence than most persons imagine; and considering the warm weather prevailing during the last vintage season it is probable that most of the cases of arrested fermentation would lose their alleged mysteriousness if this simple and well-known cause were properly taken into account.

Omitting for the present the discussion of the means to be employed for the completion of the fermentation of wines containing several per cent of unconverted sugar, I desire to call the attention of those having only a small remnant of sugar to deal with, to the importance of a thorough *aeration* of such wines in racking. This is easily done by using a rose spout instead of a solid stream from the faucet

or hose, and letting the stream fall some distance.

The effect of aeration in promoting the vinous fermentation and in eliminating undesirable ingredients, is well understood and is in Germany very commonly applied to the must previous to fermentation, in order to carry it through more promptly and regularly. In France it is more especially used in the "*fouillage*" of red wines—the daily repeated stirring-in of the pomace; in Spain and Portugal it forms the essential effect of the long and laborious treading given to the grapes, and is among the main points in the after-treatment of ports and sherries. It is not therefore an innovation but a well-proved means of promoting the fermentation, the soundness and especially the clearing of wines. Its efficacy has been well exemplified during the past vintage, by the ready fermentation of Zinfandels subjected to regular *fouillage*, to over 15 per cent of alcohol, while others, of the same saccharine strength, but fermented without aeration by the aid of a submerged frame, have remained partially sweet. Similarly the aeration in racking, suggested above and forming a good general rule as well, promotes the after-fermentation and will help to get rid of small remnants of sugar, up to one per cent or thereabouts. With proper care in the after-treatment, such aeration involves no danger of acidification or "pricking," and tends to prevent "milk-sourness."

The Copper-Lime Remedy for Mildew.

As a general answer to questions addressed to me on the subject, I state the reasons for which I think it desirable that the copper-lime remedy for mildew, lately recommended in France and reported by me in a former issue of the *RURAL PRESS*, should be thoroughly tested in California in comparison with sulphuring.

It is not correct that, as has been alleged, there is nothing new in this remedy, and that it has been previously recommended and applied here. What has been recommended and used here is sprinkling with solution of copper sulphate or bluestone, or the dusting over with a mixture of powdered bluestone and plaster or gypsum. In either case, a light rain, or even a succession of heavy dews, will soon wash away the copper salt and leave the mildew to resume its growth unhindered. Similarly, in the case of sulphur, so soon as the wind blows away the dust that has been applied during a dry time and the earth "disinfects" it so that no vapor can rise, the dormant germs revive and a repetition of the sulphuring is necessary. Near the coast, three sulphurings are very commonly needed and given, at a considerable cost of labor and material.

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When, as prescribed by the French method, milk of lime is mixed with a solution of copper sulphate, hydrate of copper is formed, which is practically insoluble in water. When its mixture with lime is sprinkled on the leaves, the drop in drying adheres to the surface and subsequently is still farther fixed precisely like whitewash, by the absorption of carbonic acid from the air and a consequent hardening. Simultaneously with the lime, the copper hydrate is transformed into hydro-carbonate; and both are somewhat soluble in atmospheric water, whether rain or dew. A very weak solution of both is therefore spread over the leaf each time the latter is moistened, but even a strong rain cannot wash the active drop entirely away. It remains and protects the vine during the season, as the French experiments have shown; partly, no doubt, from the effect of fine dust abraded and blown over the leaves not touched by the sprinkling.

Similarly, sulphur applied while the leaves

are wet, adheres and remains during several months, making *one* sulphuring suffice where two or three would otherwise have been needed. The statement that under these circumstances its vapor fails to form is simply incorrect, as any one can ascertain for himself.

One application never kills *all* the germs: the permanent presence of the antidote is needed. This is what the copper-lime remedy accomplishes, and will do more surely with us than in France, where summer rains commonly occur and may wash off the protecting droplets.

As the greater includes the less, the copper preparation with its more powerful antiseptic properties will be more effective than sulphur against *all* kinds of mildews, and will probably find its use against others than those infesting the vine. The cost of its application as against that of repeated sulphurings is the question to be determined by actual trial in California.

E. W. HILGARD.

Berkeley, January 15, 1886.